

CONVERSION FACTORS, SELECTED TERMS, AND ABBREVIATIONS

CONVERSION FACTORS

Multiply	By	To obtain
foot (ft)	0.3048	meter
gallon (gal)	3.785	liter
inch (in.)	25.4	millimeter
meter (m)	3.281	foot
micrometer (μm)	3.281×10^{-6}	foot
millimeter (mm)	0.03937	inch
milligram (mg)	3.527×10^{-5}	ounce, avoirdupois
liter (L)	0.2642	gallon
milliliter (mL)	2.64×10^{-4}	gallon

Temperature: Water and air temperature are given in degrees Celsius ($^{\circ}\text{C}$), which can be converted to degrees Fahrenheit ($^{\circ}\text{F}$) by use of the following equation:

$$^{\circ}\text{F} = 1.8(^{\circ}\text{C}) + 32$$

SELECTED TERMS

Accuracy: The degree of agreement of a measured value with the true or expected value of the quantity of concern (Taylor, 1987).

Analyte (target analyte): "Substances being determined in an analysis" (from Bennett, 1986). The term target analyte is used in this report to refer to any chemical or biological substance for which concentrations in a sample will be determined. Target analyte does not include field-measured parameters such as specific electrical conductance, pH, temperature, dissolved oxygen, Eh, alkalinity, color, or turbidity.

Aquifer: "A saturated permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients" (Freeze and Cherry, 1979).

Area-weighted sample: A sample that contains an equal volume from each unit of area sampled.

Bias: Systematic error inherent in a method or caused by some artifact or idiosyncrasy of the measurement system. The error can be positive (indicating contamination) or negative (indicating loss of analyte concentration) (from Taylor, 1987).

Bag samplers: Samplers whose containers are bags that instantly transmit the ambient pressure to the interior of the sample container and do not have opening or closing valves.

Bottle samplers: A rigid sample container that does not instantly transmit the ambient pressure to the interior of the sample container and has neither pressure compensation nor opening and closing valves. Point samplers described in Edwards and Glysson (1998) use rigid bottles but have pressure compensation and opening and closing valves and are not considered bottle samplers for the purposes of this document. **The tables in Appendix A4-A were not designed for use with point samplers.**

Centroid (as used to designate a special case of stream-sampling location for the equal-discharge-increment method): The vertical in the increment at which discharge is equal on both sides of the vertical (G. Douglas Glysson, U.S. Geological Survey, written commun., 1997).

Contaminant: Biological, chemical, or physical substances or properties added to the medium of concern through human activity or natural processes and that corrupt its ambient composition.

Contamination (of water): Corruption of ambient water composition or attributes by the addition of biological, chemical, or physical substances as a result of human activity or natural processes. Addition of such substances can degrade the quality of the water resource.

Data-quality requirements: That subset of data-quality objectives pertaining specifically to the analytical detection level for concentrations of target analytes and the variability allowable without compromising achievement of the scientific objectives of the study.

Depth-integrated sample: A sample collected when each vertical portion of the stream depth is represented in the sample in proportion to the desired sampling scheme.

- **Depth integration.** "A method of sampling at every point throughout a given depth (the sampled depth) whereby the water-sediment mixture is collected isokinetically so that the contribution from each point is proportional to the stream velocity at the point. This process yields a sample with properties that are discharge weighted over the sampled depth" (ASTM, 1990).

► **Depth integration for a discharge-weighted sample.** “A discharge-weighted (velocity-weighted) sample of water-sediment mixture collected at one or more verticals in accordance with the technique of depth integration; the discharge of any property of the sample expressible as a concentration can be obtained as the product of the concentration and the water discharge represented by the sample” (ASTM, 1990). For a discharge-weighted sample, the water-sediment mixture is collected isokinetically so that the contribution from each point is proportional to the stream velocity at the point (that is, the sample contains an equal volume from each unit of discharge sampled).

► **Depth integration to collect an area-weighted sample.** The ASTM definition of depth integration does not accommodate the concept of an area-weighted sample. Area weighting is similar in concept to discharge weighting, except that the water-sediment mixture is collected so that the contribution from each point is proportional to the stream area at the point (that is, contains an equal volume from each unit of area sampled). Area-weighted sampling is used to obtain a sample that contains the average concentration of a property that is observed in a cross section. Averaged in situ field measurements of streams are more nearly area weighted than discharge weighted. The product of an area-weighted property concentration and the stream discharge would not yield the discharge of the property unless the stream contained the same property concentration at every point.

Discharge-weighted sample: A sample that contains an equal volume from each unit of discharge sampled.

District: An office of the USGS, Water Resources Division, located in any of the States or territories of the United States.

Equal-width-increment (EWI) and equal-discharge-increment (EDI) sample-collection methods: Methods specifically designed to result in the collection of discharge-weighted, depth-integrated, isokinetic samples (Edwards and Glysson, 1998). When either method is used properly, the resulting samples contain the same property concentrations.

Isokinetic sampling: A sample collected in such a way that the water-sediment mixture moves with no change in velocity as it leaves the ambient flow and enters the sampler intake (ASTM, 1990).

Precision: The degree of mutual agreement characteristic of independent measurements as the result of repeated application of the process under specified conditions (Taylor, 1987).

Quality Assessment: Overall process of assessing the quality of the environmental data by reviewing the application of the quality-assurance elements and the analysis of the quality-control data.

Quality Assurance (QA): A system of protocols and procedures implemented to meet expected standards of quality needed to fulfill study objectives and control unmeasurable components of a study, such as sampling at the right place and (or) time using the correct equipment and techniques.

Quality Control (QC): A system of activities (such as collection of blank or replicate samples) whose purpose is to assess the quality of environmental data by generating a set of data that will be used to estimate the magnitude of the bias and variability resulting from the procedures used for obtaining the data.

Raw sample: A whole-water (unfiltered) sample that has not been processed through a filter or other phase-separation device.

Transit: To move the sampler from the stream surface to the streambed or from the streambed to the surface.

Transit rate: The rate at which the sampler is passed through the water from the stream surface to the streambed or from the streambed to the surface.

Unsampled zone: The unsampled portion of the sampling vertical, usually assumed to be the zone from the streambed to the sampler intake. Generally, sampler intakes are 4 to 7 inches above the streambed, depending on the kind of sampler used.

Variability: Random error in independent measurements as the result of repeated application of the process under specific conditions.

Vertical: Refers to that location within the increment at which the sampler is lowered and raised through the water column.

ABBREVIATIONS

<	less than
≤	equal to or less than
≥	equal to or greater than
ft/s	feet per second
gal/min	gallon per minute
L/min	liter per minute
µg/L	microgram per liter (equivalent to parts per billion)
mg/L	milligram per liter
mL/min	milliliter per minute
ppb	parts per billion (equivalent to micrograms per liter)
ASR	Analytical Services Request
ASTM	American Society for Testing and Materials
CFC	chlorofluorocarbon
CH/DH	Clean Hands/Dirty Hands
DIW	distilled, deionized water
DOC	dissolved organic carbon
EDI	equal-discharge increment
EWI	equal-width increment
FTU	Formazin turbidity unit
IBW	inorganic-grade blank water
ID	identification number that is unique to a field site, station, or well
NAWQA	National Water-Quality Assessment Program
NFM	<i>National Field Manual for the Collection of Water-Quality Data</i>
NIST	National Institute of Standards and Technology
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric turbidity unit
NWQL	National Water Quality Laboratory
PBW	pesticide-grade blank water
PCB	polychlorinated biphenyls
QA	quality assurance
QC	quality control
QWSU	Quality Water Service Unit
SRS	Standard reference water sample
TBY	turbidity
TOC	total organic carbon
URL	Uniform Resource Location
USGS	U.S. Geological Survey
VBW	volatiles-grade blank water (is also of pesticide grade)
VCF	single vertical at centroid of flow
VOC	volatile organic compound